The

Journal of Agriculture.

VOLUME IX, No. 2. | WELLINGTON, N.Z., 20TH AUG., 1914. | PRICE, SIXPENCE.

SHEEP-BREEDING.

A Paper read by Mr. W. Perry, of Penrose, Masterton, at the Agricultural and Pastoral Conference held at Wellington, on the 28th July, 1914.

TO establish and maintain at a high standard a flock of stud sheep several conditions are essential. Selection and methods of breeding must be on good lines, and the soil must be of a nature to grow feed which will produce bone, flesh, and wool of the quantity and quality required. Climate, also, is important; sheep, as a rule, do not thrive well in a wet climate, nor do long-woolled sheep appear to be a success in a very hot climate.

METHODS OF BREEDING.

From experience gained by thirty years' breeding of stud Lincoln sheep, I feel sure that success cannot be attained by using a large

proportion of outside blood. It used to be quite the fashion to go to the South Island for stud Lincoln rams—for several years I used no others. These sires looked all right, but the progeny did not come up to the same standard, more particularly in the wool—it was finer and softer. Then I tried sires from Hawke's Bay. The results were better, but a number of the progeny would be coarse and harsh in the wool. Later I got one or two sires from the Whenuakura flock, the gets from which were very satisfactory. About this time I started to use sires bred on the place with far better results. The great difficulty in the matter is to get enough good strains to carry on with; not having enough, my practice in the last few years has been to purchase a ram, try him with a few ewes, and, if satisfactory, to use the half-bloods in the flock. To buy a few ewes and breed them to one of the home sires is another good method of introducing a change of blood. It is a safe plan to have a new sire testing each year, as one is lucky if he can get one strain out of every three which will be worth introducing to the flock.

I am a strong believer in close inbreeding with a few individuals. One such cross did more for my flock than all the other matings put together. If I can get one or two females and a male of a type I wish to set, let them be ever so nearly related, I use them together, provided there is no leading fault in the strain (a condition not easy to procure). It is not wise, I think, to go further than the one cross with the close inbreeding.

Line breeding with a number of strains is, I feel sure, the best method, provided the land will keep up the bone and constitution. There has been no imported blood used, as far as I know, in the principal Lincoln flocks of the North Island for many years. I brought a ram from Victoria two years ago, but he changed so much for the worse that I did not use him. I also brought out a ram and a ewe from England last year, but it will take a year or two to test the wisdom or otherwise of the experiment.

The Lincoln-sheep breeders in England seem to use sires from other flocks to a large extent. It was quite a surprise to me to see the pedigrees of the late Mr. Dudding's flock; there were only a very few that were line-bred for any length of time. The same applied to other flocks which I inspected. The Lincoln flocks are very much of one type all through.

The flock of Romneys belonging to Mr. Quested, which is taking the lead in the show-ring and sales, is mostly line-bred, and I did not see an outside ram on the farm. Another good flock, belong-

ing to Mr. Finn, is also line-bred, and has been for many years, very little outside blood being introduced.

The fact of there being so many distinct breeds of sheep in England, and most of them being almost confined to the county which they are named after, is very interesting. It proves that to successfully establish and maintain a type of animal it is not necessary to go far afield to get changes of blood; but, on the contrary, the nearer home you get a change the less risk there is of varying the type. This applies, perhaps, more to wool, the climate and soil having such a wonderful effect on it. In this respect a large flockmaster has a very much better opportunity of being successful than a small one—it gives so much more scope for outcrossing. We have good examples of this in the splendid flocks of merino sheep in Australia, bred on the same station for many years without a change of blood.

Comparing the English sheep with New Zealand sheep, the former have more bone, constitution, and vigour, but the New Zealand animal has a far more attractive wool and a greater quantity of it.

Effect of Soil.

The soil is a most important factor in sheep-breeding, and it is a very interesting subject to note the effect that different soils have on sheep. The soils of New Zealand vary a great deal, and most of them are in a natural condition. It is very different in England, where the soil has been manured and limed to obtain the best results. In the Wairarapa there are four varieties of soils which predominate — viz., alluvial deposit, clay, clay with shingle, and limestone formation. From what I have observed, the alluvial soil grows an attractive wool with plenty of silver lustre, but does not produce a great quantity of wool; the bone also shows quality, but if a flock were bred within itself on this land it would lose substance and go back. The limestone hills of the Wairarapa are renowned for the good sheep they grow. One sees fine mobs of robust, strong-boned sheep coming from these hill pastures, but they have a different style of wool from those grazed on the clay and shingle plains. The wool grown on the limestone has a firmer feel, but not a great deal of lustre; the locks are smaller, and, though there is a fair amount of curl, it is difficult to produce a showy fleece on such country.

The district where my farm is situated is called the Taratahi, which used to have a reputation for clay, stones, and rabbits; and now, within a radius of about five miles, there are ten stud-sheep

breeders, most of whom enjoy more than the ordinary success in the show and sale rings. The land is either of a clay nature or clay with shingle. My early experience in breeding Lincoln sheep was that it was very difficult to produce a first-class animal; the frame was loosely put together, with a want of flesh. It was easy to produce plenty of wool, but there was a want of curl and always a whiteness on the outside; in fact, there was something wanting all round. Better results were obtained by the use of bonedust and superphosphate in growing turnips and rape for young stock. This also had a marked effect on the pastures: it caused

An English-bred Romney.

a greater bulk to grow than formerly, but there was very little growth in the winter-time, and the coarser grasses predominated. Under these conditions the sheep thrived better than they had done previous to the manuring, but since the advent of basic slag there has been a very marked change. The improvement of the pasture is very noticeable, the better grasses and clovers predominating now where Yorkshire fog thrived before; but a further improvement can be made with an addition of lime. I have used enough lime to prove that on soils of a clay nature, such as mine is, it pays to dress with a ton of lime per acre in conjunction with slag and other manure. The effect on the sheep depastured on the land

which has been top-dressed with basic slag is the production of firmer bone, a lot more flesh, and the sheep seem far more vigorous ; the wool is firmer, shorter in the curl, and carries the yolk right to the tip. The result of using lime has made a decided increase in the bone of the animal, and already a change has to be made in the selection of sires on account of the wool being inclined to grow on the strong side.

The tendency of my sheep in the past has been to run to wool at the expense of the frame, and I have bred Lincolns, English Leicesters, and Romneys with the same result. But with the free

A New-Zealand-bred Romney.

use of basic slag and lime I feel sure that the proper balance of nature will more easily be maintained.

I was on several farms in Kent, where some of the best Romneys are bred. That of Mr. A. Finn is on alluvial marsh land. This flock showed the same lustre in the wool as that produced on the alluvial land in this country, but the sheep have more flesh and bone. The flock belonging to Mr. Quested is bred on the chalky downs near Folkestone. These sheep show very plainly that the soil they graze on suits them. They are good-boned, even-fleshed, robust sheep, with a very even, useful wool. It is very easily seen by any one who has studied this question that these sheep

are running on land with a sufficiency of lime in it. There are several farms I visited with a soil of a light-loam nature; the sheep on these farms showed a want of substance and constitution both in the frame and wool. Another farm was of heavy clay, but it had been dressed with chalk, as there were pieces showing on the surface; the sheep had wool more like that grown in my own district than any I saw in Kent, but they had not as much flesh and bone as some of the other flocks.

The Lincoln-sheep breeders seem to try to grow their sheep as big as they can get them, and no doubt they have some fine animals; they are much more uniform than the Romneys, but in getting size they have also got long legs—so much so that they are of very little use to New Zealand breeders. There is no doubt about their constitution—they look as strong as donkeys, and the wool is of a finer fibre than that produced in New Zealand, but much less of it. The flocks I saw, with one exception, were bred on chalk land; the exception being the late Mr. Dudding's home farm, which I was told was of sandstone-clay formation, and I noticed that the sheep did not show the bone which some of the other flocks did, but their wool was of a far more attractive character.

The Southdown sheep shown at the Royal were not as even as one would expect them to be; there were a few beautiful sheep with both size and quality; on the other hand, some breeders seem to be going in for a coarser animal, and some of these secured the leading prizes. This breed is bred over a wider area than some of the other breeds, which may have something to do with the variations. Those from the south were the finest quality. The home of the Southdown is on the downs in the south of England, which are of a chalk formation; the soil is very light and dry, and no doubt has had an influence on the size and the fineness of the wool of this breed.

There seem to be several reasons why English sheep are more robust than New Zealand sheep. One is that more attention, when selecting for breeding purposes, has been paid to size and constitution in England than here; another is that the soil is more suited to grow bone and flesh than our average soil is; and, further, that the climate, being a very much colder one than ours, has, I think, a direct beneficial effect on long-wool sheep, and an indirect influence through the quality of the food grown in a cold climate. The fat-producing qualities of the grass and green foods grown in England cannot be nearly so great as those grown in New Zealand, owing to the want of sunshine in the Old Country. We have direct evidence on this point in the way sheep and cattle top off

on grass in New Zealand, but they have to get oil-cake and grain to attain the same results in England, especially in the northern parts. I think, however, the English feed is more flesh- and bone-producing.

This is a question which New Zealand stud breeders should look into. Our soils produce an abundance of good wool, but we are decidedly behind the English breeders in flesh and bone. Top-dress with basic slag and lime, use less fat-producing foods (such as rape), feed plenty of hay in the winter, and, if using other foods, avoid those which are likely to produce much fat. Foods such as oil-cake, wheat, and barley should be used very sparingly if at all. A few years ago I discovered that it was a mistake to use rich foods for getting sheep up for show purposes: the animals are far brighter, stand travelling much better, and are healthier afterwards when fed on a plain diet.

It would be very instructive if analyses of the soils of the different stud farms where stud breeding has been successful in New Zealand were obtained and compared with those of England.

In conclusion, I see no reason why we should go to any other country for a change of blood if we make proper use of our soil and climate.

SPANISH SULLA.

TESTED AT RUAKURA FARM OF INSTRUCTION.

A. W. Green.

When the Rev. Dr. Capra, Agricultural Commissioner for the Italian Government, visited New Zealand he spent some time at the Ruakura Farm of Instruction. During his inspection of the forage plots in the horticultural section he remarked, on seeing the African sulla, that we did not have the best variety of sulla or, as it is sometimes called, Maltese clover. He suggested that the Spanish sulla should be secured and tested as a stock food under New Zealand conditions. He stated that the peasants of his country had made excellent use of poor clay hillside lands by means of this plant. It grew luxuriously under careful treatment in the inhospitable soil, and by the means of goats which were tethered on the sulla a thriving dairy industry had been developed.

Seed of the suggested variety was secured by the Ruakura Farm from the noted French firm of seedsmen, Messrs. Villmorin and Andrieux. The seed was sown on the 5th November, 1913,

Spanish Sulla.

African Sulla in the foreground; Spanish Sulla behind.

S. B. Taylor, photo.]

SULLA AT THE RUAKURA FARM OF INSTRUCTION.

in a plot in the nursery. The soil on part of the plot is sandy, and on the other heavy clay. A dressing of basic superphosphate was applied with the seed, but only sufficient to give the plants a start. It would not be more than 3 cwt. per acre. The crop made vigorous growth from the start, and could have been cut three months ago. Part of the crop was cut on the 27th June, and fed to cows and sheep. Considering it was a new feed, the cows ate it well, and did not leave a single stem. It was equally palatable to sheep. On the morning after cutting there was a heavy frost, 8 degrees being registered, but it apparently has not damaged the plants in any way. A heavier crop was produced on that portion of the plot having a clay subsoil. It attained a height of 3 ft. 6 in., and the estimated yield was 11 tons per acre.

A most striking feature in this experiment is the remarkable growth made by Spanish sulla in comparison with the African variety. The latter was sown on the same day and under the same conditions as the former, but the resultant crop is not more than half by weight. The growth has been much slower, and the leaves lighter in colour, showing that the strain is of weaker vitality.

As these two sullas are known under the one botanical name, *Hedysarum coronarium*, it would be advisable to order seed under the name of "Spanish," stating at the same time, "not African sulla."

As much seed as possible will be saved from the plot this season. A further experiment with this plant is very desirable, as there is reason to believe that it might be of considerable value on the poor clay soils of North Auckland.

SEMI-OFFICIAL TESTING.

W. M. Singleton.

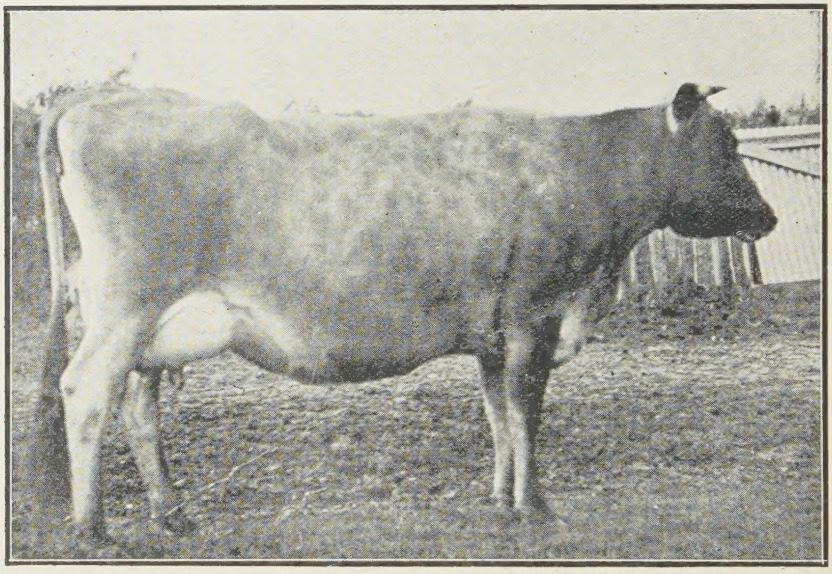
The following list of Jerseys and Holsteins which have qualified during the last month provides changes in the premier position of a number of classes.

While May's Dainty does not displace Lady of Collingwood as the best two-year-old Jersey, her record is the best for the year thus far, and is certainly a splendid record when her age at the commencement of test is taken into consideration. In the three-year-old class Pepper displaces Mr. R. J. Linn's Belvedere Rose. While Belvedere Rose's record of 451·68 lb. fat in 294 days is very creditable, it is only fair to state that it would have been better had not abortion interfered with the completion of her record.

Pepper's record of 546·01 lb. shows an increase on that of Frisk (reported last month) of 3·73 lb. butter-fat. While Frisk has pride of place as the best mature cow of the breed, Pepper has the highest record for all classes.

In the Holsteins Nancy Lee of Cliffside replaces Netherland Princess IV as the best two-year-old. This heifer is a daughter of Cliffside Laddie, and we expect to hear from another daughter of his shortly.

Viola is a cow of which her owner is doubtless very proud. Her record for the time being is the best of those which have been completed. That this record was made on twice-a-day milking



The Jersey Cow, Pepper.

is in her favour, and shows what can be done under practically normal conditions. Weights of her milk were recorded neither on the day of calving nor the day after calving, consequently she got credit for only 364 days. She freshened again in seventeen days after her milking-period was closed. This is certainly a great performance.

A great deal of credit is due to the owners of all cows which stand at the head of their classes. It must be recognized that at the present state of our yearly testing these honours do not, as a rule, remain long with the one individual. If all goes well, a number of the present leaders will be displaced before many weeks,

The Holstein-Friesian Cow, Viola.

and we trust the present leaders will enjoy their honours to the u'most in the meantime.

Name of Cow.	Name and Address of Owner.	Age at Starting Test.	Yield for Season.		
			Days.	Milk.	Fat.
	JERSEYS.				
	Two-year-old Class.				
		Yrs. days.		lb.	lb.
May's Dainty ..	J. M. Clague, Manaia ..	1 307	364	7475·90	466·95
Belvedere Wildflower	A. E. Missen, Rototuna	2 346	301	6550·60	302·83
Spotted Fox ..	A. M. Wighton, Palmerston North	1 225	274	5108·00	246·50
	Three-year-old Class.				
Pepper	A. E. Wilkinson, Pukekohe	3 195	365	9288·40	546·01
Dominion Lovely's Gem	A. E. Missen, Rototuna	3 252	327	7500·50	405·00
Lady Leaflet ..	C. Goodson, Hawera ..	3 332	262	5408·20	323·78
	Four-year-old Class.				
Bilberry IX.. ..	E. Hodges, Waimana ..	4 359	293	7088·70	391·92
	Mature Class.				
Lady Molly ..	S. R. Lancaster, Palmerston North	8 311	334	9989·50	528·84
Madam Malaprop V	Ranford Bros., Stratford	10 257	335	8465·30	439·80
	HOLSTEINS.				
	Two-year-old Class.				
Nancy Lee of Cliffside	W. I. Lovelock, Palmerston North	2 124	365	14884·55	498·88
Lady Sylvie ..	J. Deacon, Manaia ..	2 330	349	12536·80	460·37
Dominion Huia ..	Weraroa Experimental Farm	2 258	337	8216·55	307·80
	Three-year-old Class.				
Aurora De Kol ..	G. Aitchison, Kaitangata	3 133	365	15256·00	597·45
Queen of De Kols ..	W. I. Lovelock, Palmerston North	3 302	346	13591·30	410·78
	Mature Class.				
Viola	J. H. Parkinson, Opotiki	Aged	364	14817·60	661·16
Daisy	Weraroa Experimental Farm	,,	299	14632·60	425·79

AGRICULTURAL SHOW DATES.

Hawke's Bay A. and P. Society.—Hastings, 21st and 22nd October.

Dannevirke District A. and P. Association.—Dannevirke, 10th and 11th February; Ram Fair, 12th February.

QUALIFIED VETERINARY SURGEONS.

NEW ZEALAND LIST.

The following list of qualified veterinary surgeons known to be residing in New Zealand is published for the guidance of stock-owners and for general information.

In the event of the name of any properly qualified veterinarian being omitted, it is requested that he communicate with the Editor, giving particulars of his qualification, in order that the necessary steps may be taken for the inclusion of his name in the next published list.

Ashe, G. G., M.R.C.V.S., Timaru.
* Barnes, A. W., M.R.C.V.S., Hastings.
Begg, W. P., M.R.C.V.S., Ashburton.
* Blair, W. D., M.R.C.V.S., Dunedin.
* Blake, T. A., M.R.C.V.S., Wellington.
Brodie, A. M., M.R.C.V.S., Hastings.
* Broom, G., M.R.C.V.S., Gisborne.
* Burton, S., M.R.C.V.S., Wellington.
* Clayton, J. G., M.R.C.V.S., Wellington.
Cockroft, J. E., M.R.C.V.S., Palmerston North.
* Collins, W. T., M.R.C.V.S., Hamilton.
Crossley, F., M.R.C.V.S., Wellington.
* Cunningham, T., M.R.C.V.S., Oamaru.
Danskin, J., M.R.C.V.S., Balclutha.
Edgar, P. M., M.R.C.V.S., Wanganui.
* Elphick, E. E., M.R.C.V.S., D.V.H., Christchurch.
Glover, F., M.R.C.V.S., Hamilton.
Hamilton, A., M.R.C.V.S., Musselburgh, Dunedin.
* Hickman, A. J., M.R.C.V.S., Auckland.
* Howard, E. C., M.R.C.V.S., Wellington.
Johnson, A. A., F.R.C.V.S., Christchurch.
* Kerrigan, J., M.R.C.V.S., Christchurch.
Lilico, T. G., M.R.C.V.S., Christchurch.
* Lyons, J., M.R.C.V.S., Auckland.
Machattie, D. H., M.R.C.V.S., Leeston, Canterbury.
Marquis, N., M.R.C.V.S., Waiuku, Auckland.
Martin, H. E., M.R.C.V.S., Gore.

* Officers of the Live-stock and Meat Division, Department of Agriculture, Industries, and Commerce.

McLeod, J., M.R.C.V.S., Christchurch.
* Meade, R. H., M.R.C.V.S., Waitara.
Miller, J., M.R.C.V.S., Invercargill.
Neale, C. R., M.R.C.V.S., Hawera.
* Paterson, A. M., M.R.C.V.S., Timaru.
* Primmer, J. H., M.R.C.V.S., Palmerston North.
Quinnell, W. C., M.R.C.V.S., Wellington.
Rait, D. H., M.R.C.V.S., Palmerston North.
* Reakes, C. J., D.V.Sc., M.R.C.V.S., Wellington.
* Reid, H. A., F.R.C.V.S., D.V.H., F.R.S.E., Wellington.
Robertson, F. C., M.R.C.V.S., Ashburton.
Robertson, F., M.R.C.V.S., Oamaru.
Siddall, E. Lloyd, M.R.C.V.S., Opotiki.
Simpson, C. S., M.R.C.V.S., Parnell, Auckland.
* Snowball, W. D., M.R.C.V.S., Dunedin.
* Spilman, D., M.R.C.V.S., Wellington.
* Stafford, J., M.R.C.V.S., Christchurch.
† Stapley, W., M.D., D.V.Sc., M.R.C.V.S., Cambridge.
Taylor, A., M.A., M.R.C.V.S., Lincoln, Canterbury.
Taylor, J. B., M.R.C.V.S., Waverley.
* Taylor, W. G., M.R.C.V.S., Ashburton.
Ward, J., M.R.C.V.S., Katikati, Bay of Plenty.
* Waugh, G. N., M.R.C.V.S., Invercargill.
* Wood, R. B., M.R.C.V.S., Auckland.
* Young, A. R., M.R.C.V.S., Wellington.
* Kyle, H. S. S., G.M.V.C. (Melbourne), Christchurch.
* Marsack, H. L., V.S. (Ontario), Auckland.
Ring, W. C., V.M.D. (Penn., U.S.A.), Ellerslie.

* Officers of the Live-stock and Meat Division, Department of Agriculture, Industries, and Commerce.
† Not now practising as a veterinary surgeon.

GROWTH OF LUCERNE.

Single plants of lucerne which were allowed to remain uncut at the Moumahaki Experimental Farm for the whole season exhibited three distinct periods of growth. Plants which were cut once, late in autumn, have made a robust winter growth, and in many cases have reached 27 in. in height. This indicates that lucerne may with distinct advantage be cut at less frequent intervals.—*W. S. Hill, B.Agric.*

During the year ended 31st March 51,943 cases of apples, 1,633 cases of pears, and 201 cases of peaches were exported from New Zealand, the bulk of these (51,787 cases of apples and 100 cases of pears) going to South America, the balance going to Vancouver and San Francisco. The Nelson Province contributed the bulk of the apple-export, that province sending 37,097 cases to South America.

THE WAR.

AN APPEAL TO FARMERS BY THE PRIME MINISTER.

Extension of Cereal-production desired.

The following appeal has been issued to the farmers of the Dominion by the Prime Minister and Minister of Agriculture, the Right Hon. W. F. Massey, P.C. :—

"Speaking in the House of Representatives some days ago, I suggested that the farmers of the Dominion would be doing good service to the Empire if they made arrangements to grow this season as much cereal produce as possible, and I now wish to emphasize the importance of this matter, and to appeal to farmers to do all in their power to put it beyond doubt that at the next harvest New Zealand will be able to do her share towards providing against the world-wide shortage of breadstuffs that is only too likely to be experienced as a result of the great strife of nations that is now in progress. It is quite possible that if the war is prolonged it may be found that the side possessing the largest food-supply will have a highly important advantage over its enemies, and as no one can foretell with any certainty whether campaigns conducted with the colossal armies of the present day will give decisive results, it may even happen that ample supplies of food will be the ultimate determining factor in the struggle. I need not add that if a general shortage of cereals does occur, farmers who have endeavoured to help their country by providing this class of produce may find that in serving the Empire's interests they have also served their own. I therefore ask the patriotic farmers—and that means all the farmers of the Dominion who have suitable land—to at once put the necessary operations in hand, with a view to growing as much as possible of wheat and oats, thus giving to the Empire what may prove to be extremely valuable assistance.—W. F. Massey."

WORK FOR THE COMING MONTH.

NEW ZEALAND is a country of wide variation in climatic and soil conditions. In applying suggested procedure it is, therefore, necessary for the farmer to amend it to suit local weather-conditions and the requirements of his soil—information which can best be ascertained by a study of these problems on the part of the farmer himself. Nothing can take the place of local knowledge. Little advice on an agricultural subject is capable of general application in its entirety.

THE FARM.

Primrose McConnell.

September is among the busiest of the months in all branches of farming. Cereal-sowing should be brought to a finish as soon as possible. Late-sown cereals are more susceptible to rust, and, generally speaking, the yield is unsatisfactory.

Where early fat lambs are raised an area of rape should be sown about the beginning of the month.

For early sowing the use of a ridger has many advantages. A deep, fine tilth should be secured, a finish being given with the Cambridge roller immediately in front of the ridger. Where the land is of a light nature the roller may be again used after the ridger, but not on land of a heavy nature. By the ridging system the early-sown plants do not run the risk of being "drowned out," as they often are when sown on the level. On weedy land horse-hoeing can be commenced as soon as the weeds appear without danger of smothering the young plants. In New Zealand generally this very important work of intercultivation is neglected to a very serious extent. Horse-hoeing invariably results in a better crop, minimizes the effects of drought, destroys weeds, and to some extent lessens the risks from disease and parasites. By the ridging system there is also less waste from treading under, because the sheep, unless disturbed, will walk between the rows. It is, of course, admitted that the ridger cannot be used on all farms, but in writing these monthly articles the writer has in view the intensive farmer rather than the large holder, as it is quite evident that the farm of the future will be comparatively small, but worked on highly intensive lines.

As manure for rape basic superphosphate may be used with every confidence at the rate of from 2 cwt. to 3 cwt. per acre, and if the land is of a light nature add 12 lb. sulphate of potash. At

Ruakura the rows are made 27 in. apart and seeded at the rate of 2½ lb. rape and 4 oz. mustard. By sowing early, the first growth will be fed off before blight appears, and the majority of the lambs fattened. A first-class crop of rape will fatten from thirty to fifty sheep per acre.

Every effort should be made to prevent the young lambs from receiving a check, because when this occurs the best results are impossible. As to stud lambs, the writer is strongly of opinion that they should never be put on rape. In their case nothing is better than a young pasture, with the addition of a little sweet chaff and a very few oats and peas. Splendid results have been obtained at Ruakura this season from a catch-crop of Western Wolths grass sown after harvest. On this feed stud hoggets have thriven amazingly. The nature of the soil and subsoil is of the utmost importance in successful stud-stock rearing, the limestone formation being the best.

Early-sown oat crops that have already been fed off should now receive a stroke of the tine harrows. This breaks up the hard surface soil and seems to have a stimulating effect on the plants generally. To some extent it also minimizes the effects of drought by forming a light soil mulch.

Chou moellier sown at the beginning of the month will make splendid cow-forage by the beginning of the year. This also applies to Buda kale. In the case of chou moellier no taint will be given to the milk if the plants are fed before they become too mature and always just after milking. The seed of both should be sown with the ridger, if that implement is available. When the chou moellier plants reach a height of 3 in. they should be singled out to a distance of not less than 2 ft. apart in the rows. A good crop of chou moellier will reach a weight of 60 tons per acre. Being surface-rooted, it is a gross feeder and responds readily to liberal treatment in the matter of manure. A mixture of 3 cwt. of basic superphosphate and 2 cwt. of bonedust is recommended.

Where there is no danger from frosts the main crop of potatoes may be planted towards the end of the month; but, generally speaking, better results are had from planting about the end of October, or even the beginning of November. For this crop the land should be autumn-ploughed, as deeply as the subsoil will permit, with thorough after-cultivation. A strong cultivator, running at a depth of 10 in. or so, is excellent for this purpose. For potatoes the cultivation should be deep, but a very fine tilth is not so essential as for other farm crops. A report on the last year's potato crop at Ruakura will be found in the June issue of the *Journal*. Strange to say, many farmers are of the opinion that better results are obtained when the manures are applied to the

surface immediately after the potatoes are covered in. On no account should this be done. The manure is to a great extent wasted as far as the potato crop is concerned. The fertilizers should come in direct contact with the sets. Only in the event of applying highly nitrogenous manures, such as nitrate of soda or sulphate of ammonia, should top-dressing be resorted to, and such fertilizers should be applied after the first hand-hoeing, and put close up to the plants with a double-mouldboard plough. A little sulphur (say, 30 lb. per acre) may also be added to the manurial mixture. This is an ingredient which undoubtedly has a stimulating effect on plant-life, and we can afford to ignore the "why and wherefore" for the time being. Even as a top-dressing for pastures it has given most marked beneficial results at Ruakura.

The potato rows should be made from 27 in. to 30 in. in width, and the potatoes planted about 14 in. apart. The depth of soil covering should not be more than 5 in. Care should be taken to plant the best types of tubers only, and misshapen ones should on no account be used. With medium-sized sets the quantity required per acre will be about 14 cwt.

Where pig-breeding is carried on—and it is one of the most profitable side lines of the dairy farm—a considerable area of artichokes should now be planted. The tubers make excellent pig-food during the winter months without the labour of carrying feed. A number of pigs have been carried on a small area of this fodder at Ruakura, with the addition of chaffed lucerne hay, and they kept in excellent condition. The pigs root out the tubers as they require them, and sufficient is left in the ground as seed for the next crop. Rape may also be sown as pig-food any time in September. Good results have been obtained from a mixture of cut mangels and chaff, and the cost of feeding is very low. In pig-breeding the best quality only should be kept—inferior pigs do not pay for their keep. In the North Island, generally speaking, pigs require little shelter—just sufficient to shield them from a hot sun, or an exceptionally cold, wet spell. Under such conditions they are infinitely more healthy than when cooped up in filthy and much-limited space. Brood sows as they come near to farrowing should be separated from the others, and quiet, but not confined, quarters be provided, and for a few days previous to and after farrowing their food should consist principally of sloppy bran.

Pastures intended for hay should now be closed up, after having been chain-harrowed, sticks, stones, wire, &c., gathered off, dangerous potholes filled up, and stumps marked with a good stake. This work often saves serious delay and expense caused by breakages in haymaking implements. The roller may also be used to advantage.

When dry enough, land intended for a root crop and which has had a previous ploughing may be again turned over. The disc plough is suitable for this purpose—in fact, much more suitable than for ordinary ploughing. As a plough in the correct sense of the word it is a failure. The ploughing-under of green-manure crops should be completed, and for this work nothing equals the swamp-plough. When there is a great bulk of green stuff it is a good plan to roll in front of the plough and in the same direction as the furrow.

The dairyman's work will now be unceasing. Where there is a large herd it is a great convenience to have the dry cows separated from those in milk, and just bring them in as they calve. The value of such succulent food as mangels will now be appreciated. In a previous article the writer stated that, of all cow-fodders tested at Ruakura, green lucerne had given the best results, and, so far, this statement holds good; but it has been found that after changing from lucerne ensilage and hay to mangels and hay there was an immediate increase in the milk-flow. The utmost care, however, should be exercised in feeding this valuable root. A limited quantity should be given daily, and only after they have been stored for some time. Much loss often arises from turning cows in to a mangel-paddock to eat their fill of unripened material. It is true that the mangel is an expensive crop to grow. A good crop will pay, and pay handsomely; on the other hand, an indifferent crop is grown at a dead loss. The former may mean 60 tons per acre, the latter 10 tons, or even less.

Cow pastures in which supplementary forage has been fed during winter become very dirty and stale, and the cows should be given a complete change to clean ground, the winter pasture being thoroughly harrowed and all stock kept off for a week or two. Small paddocks, which make a change at short intervals possible, is the main essential in intensive farming. 100 acres divided into 5-acre lots will carry more stock if well farmed than 200 acres of similar land badly farmed and enclosed with a ring fence only.

THE ORCHARD.

W. A. Boucher.

Cultivation of Orchard Lands.

Of late years it has come to be well recognized that cultivation of the soil is one of the essential features of orchard-work. In the case of well-established as well as of young trees, the opening-up and aerating of the soil proves of considerable benefit. Moreover,

cultivation is necessary for the retention in the soil of the moisture required to maintain the vigour of the trees during periods of dry weather, and for the development of the crops of fruit.

Planting.

The planting of orchard-trees should have been completed during the month of August, but under certain conditions of climate or soil this may have been impossible, or at any rate undesirable. Under such circumstances, planting may still be continued during the month of September. Even with such early-blossoming fruits as peaches and nectarines it is better to wait until the soil is in a suitable condition for the setting-out of the trees than to hurry on the planting at a time when conditions generally are unfavourable.

Spraying.

Mussel Scale and Red Spider.—Spraying for the control of these pests, as previously advised through the pages of this *Journal*, should have been carried out at an earlier period of the season. If this has not already been done, in some localities at any rate, it may not yet be too late to use the red oil diluted to the winter strength. But it is most important that growers should bear in mind the fact that when the application of the mixture is made the trees should be in a dormant condition, with the buds closed; otherwise serious damage will occur.

Fungus Diseases.—Growers are again reminded of the necessity for using the Bordeaux mixture (winter strength) for the control of such fungus diseases as apple-scab (*Fusicladium dendriticum*) and pear-scab (*Fusicladium pyrinum*). Neglect to use winter spray intensifies the difficulty of controlling these diseases during the spring and summer months. Growers are advised to apply the Bordeaux mixture, 10-10-40 strength, when the buds show signs of swelling. It must not be supposed that this one spraying will be entirely effective in controlling these diseases throughout the season, but, at any rate, it proves of very material assistance in keeping them in check.

Scale Insects on Citrus-trees.—Orange and lemon trees are usually infected with scale insects of some description. Black scale (*Secanium oleæ*) is almost always found. The most effective remedy is to spray with the kerosene emulsion when the young scale are on the move. Careful observation will indicate the time when the application of the spray will afford the most satisfactory results. As to the exact period no hard-and-fast rule can be laid down, as the time of hatching will depend upon the climatic conditions of each season.

THE VINEHOUSE AND VINEYARD.

S. F. Anderson.

The following notes on the disbudding of the vine are intended to apply to vines whose rods are more than one year old.

When vines are pruned back in the winter the shoot that has borne fruit the preceding summer is cut back to a strong bud at its base. If this is done a strong new fruit-bearing shoot can confidently be looked for, and in nine cases out of ten will be the best that can be obtained. As the vines get older, however, semi-dormant buds will also send forth shoots. It is just here where the disbudding has to be done. Before breaking out any it is well to allow them all to make a start of some 6 in. or so. It can then be seen which are the strongest and the most desirable to retain. As stated above, the one from the base of the shoot is usually the best, but it may be desirable to keep a second one in case of accident, and it is not until they have made some growth that this selection can be made. Then the weakly and otherwise unsuitable shoots can be broken out. In breaking out these superfluous shoots some care is required to avoid injuring the one that is to be retained. Where there is a risk of doing that it is better to pinch off with finger and thumb. Some growers leave two strong buds at pruning-time. This is only necessary, however, with those kinds that are doubtful starters, such as Duke of Buccleugh, Barbarossa, and a few others. In such cases, if it can be done, retain the shoot from the lower bud and rub off the other one. Leaving more buds than necessary when pruning has the effect of producing those unsightly hornlike growths which disfigure many an otherwise well-managed vinehouse. Although only one shoot should be allowed to grow from each node or joint, it is a wise precaution to retain two in case of accident, as one can easily be suppressed later.

As the heat increases particular care is required with the ventilation. Always have some air on except when a cold southerly is blowing. In that case plenty is admitted through the cracks, but as a rule there should be always a fair circulation increasing and diminishing with the sun's heat.

Look out sharply for the appearance of mealy bug, and apply methylated spirits wherever seen.

This is the month for grafting vines. Keep the vine borders clear of weeds by frequent hoeings. Cultivation promotes healthy growth by sweetening the soil, regulates the supply of moisture, and is the best of all stimulants to growing plants.

Where the second ploughing of the vineyard—that is, turning the soil back from where it was put by the winter ploughing—is completed it is better to work the soil down with the cultivator rather than with the harrow. Harrowing tends to consolidate, which the cultivator does not. The cultivator will level and bring the soil to a fine tilth, beside destroying weeds more effectively. Vineyards kept clean resist the frost better than those overgrown with weeds.

In the vineyards of the North black-spot may make its appearance almost with the appearance of the young leaves; indeed, this is very likely where winter spraying has been omitted. The summer formula of the Bordeaux mixture must now be used to prevent this trouble from spreading.

The Cellar.

During this month and next careful attention should be given to cellar-work. The dry westerly winds cause considerable shrinkage of wine in cask. Every cask should be seen to and filled up, and the date of doing so put on the end. The better the construction of the cellar the less frequent is the filling-up required. The filling-up of casks containing light wine should never be omitted. Claret and the lighter Burgundy is the most subject to "flowers." If this shows (it is a slight mouldy scum) the cask should be filled up and run over a little to get rid of it, and space made for a small quantity of strong spirit poured gently in. If carefully done this remains on the top until disturbed, and prevents further growth of the mould. With the gradual rise in temperature the wine, especially if new, will "move" more or less. When any work with the wine causes an overflow, or the wetting of the outside of the casks, this should be carefully wiped away with a damp cloth and lime sprinkled on the floor under the casks. The bungs should be sealed up with paraffin wax.

THE POULTRY-YARD.

F. C. Brown.

The Month's Work.

August is another busy month of the hatching and rearing periods. Eggs of all the heavier breeds should, if possible, be placed in the incubator or under the hens this month. There are two months available for hatching the lighter breeds. Those who only require a small number of chickens in order to renew stock of the lighter breeds will find in most cases that the best results will be secured from pullets hatched during September. There should therefore

be no delay in making preparations to finish hatching operations, which should not be delayed beyond the first weeks in October at the very latest. Not only are chickens hatched out during the hot summer months difficult to rear, but it is also generally found that they make poor progress when the days begin to shorten. There are no chicks that do so well as those that are growing as the days are lengthening. I have seldom known (under ordinary methods of management) late-hatched stock to make robust birds or birds that have been really profitable. Not only this, but they frequently lay undersized eggs, and, not having the necessary vigour, are susceptible to all forms of disease.

Hatching and Rearing Troubles.

Already reports are reaching me of poor hatches and mortality among chickens. Either the incubator or the brooder is blamed. Before placing all the blame on the artificial contrivance it would be well for those in trouble to more carefully study these important subjects and see if they have not been inviting failure by neglecting some essential detail or leaving too much to the machines. Artificial hatching and rearing are delicate matters, demanding much more care and attention than is usually bestowed on them. It is only those who realize that it is they who are entrusted with the main responsibility, and not the inanimate apparatus, who really succeed with artificial chicken-production.

I would again emphasize the imperative necessity of cleanliness in all stages of brooding. The brooder and everything connected with it cannot be too clean.

Feeding the Chicken.

It is apparently necessary to emphasize that chickens do not require much food for the first few days, requiring nothing at all for at least thirty-six hours after they are hatched. If fed at once, or even if overfed during the first week, they will not assimilate the yolk which they absorb just before leaving the shell. The first thing after the thirty-six hours period of rest fine shell-grit (from which the dust has been removed) should be placed before the chickens. For the first week the chicks should be fed every two hours, the intervals being increased as the chicks develop. Only the best of food should be provided. For the first two days dried coarse oatmeal, run through a fine sieve, may be used. From then to the fifth day a little broken wheat should be added. This may be slightly moistened with a raw egg a short time before using; this will cause it to swell, and prevent it from doing so in the chicken's crop. From the sixth day up to a month a good mixture

is—crushed wheat, 40 lb.; crushed maize, 15 lb.; hulled oats, 25 lb.; broken rice, 10 lb.; crushed peas, 5 lb.; canary-seed, 5 lb. Clean water and charcoal should be always before the chickens in addition to the fine grit. Green food is essential, but this should be tender and succulent, not coarse grass or hard fibrous growth. A little boiled meat passed through a mincing-machine may be given when the chicks are a few days old. At a month old a good growing-food consists of equal parts of cracked wheat, maize, and hulled oats. Two essentials to all growing stock are fresh air and exercise.

New Breeds.

There is a tendency in some quarters to take up any new breed, generally untried from a utility viewpoint and with merely a new style of feathering as its principal recommendation. It is a much safer policy to adhere to the well-known breeds which have been so well improved as utility stock, especially as some of the new types have yet to be developed for standard requirements even before the work of selection to secure a utility standard is attempted. The endeavour to advance breed characters and utility qualities at one and the same time is an almost impossible task. It is most important from the individual as well as the national point of view that we should do all in our power to preserve at a high standard the breeds we have developed to suit our special requirements.

Exhibition Utility Poultry.

I have been more than pleased at seeing so many birds bred at the Department's poultry-stations or from stock or eggs secured from these breeding-centres exhibited at the leading poultry-shows by their owners in such fine form, the birds in most cases showing themselves off to the best advantage, owing to the excellent manner in which they had been treated and prepared for exhibition. It was also gratifying that in many cases these birds either won or occupied an honourable position in the prize-list. I have not seen that the Department was given any credit in connection with these very successful types (which won both in utility and open classes), but no doubt this was due more to an oversight than to any intentional desire to ignore the Department.

THINGS TO REMEMBER.

The only satisfactory way of treating chicken troubles is to prevent them.

Vermin are bad for adult stock, but with chickens they are fatal.

Do not overcrowd the brooder.

The chicken-food should be of the best quality, and be given in small quantities but often.

Do not think that any green stuff is good enough for the chickens. It should be tender and be cut up into small particles.

Put the grit for chickens through a fine-gauze sieve, so that the dust may be eliminated.

Cleanliness is probably the most important essential in poultry-keeping, but nowhere is it more important than in the hatching and brooding stages.

THE APIARY.

F. A. Jacobsen.

Eliminating Scum and Manipulating for Smooth-grained Article.

At the recent conference of New Zealand beekeepers held in Wellington on the 17th, 18th, and 19th June considerable discussion took place with reference to marketing honey free from scum, also in regard to manipulating honey to artificially produce a fine smooth grain. A question was asked, "What is scum?" and no satisfactory answer was received. The question was no doubt raised through the action of the Government honey-graders in declining to grade honey for export which they considered had an excessive amount of scum on the top. The action of the Department was upheld by a large majority of beekeepers. No system or method by which a scumless fine-grained honey could be produced was provided at the conference. These notes may therefore be of assistance to many beekeepers.

Kind of Honey.

Recently I graded at Hawera a line of 200 tins of honey produced by Mr. J. Nicholas. It was the finest lot I have seen. Each tin was absolutely scumless, and the grain was perfect. Other lines from the same district were, without exception, coarser in the grain, and one lot in particular had from 1 in. to 4 in. of scum. Others had from a fraction to $\frac{1}{4}$ in.

Mr. Nicholas has at the present time some five hundred colonies of leather-coloured Italian bees in twelve-framed hives. All the frames are staple-spaced for easy manipulation. His apiaries are located in an extensive dairying district, and the flora from which

the bees gather is rewarewa and boxthorn in spring, white clover in abundance during the summer, and thistle and boxthorn in the late summer or autumn. The rewarewa is used exclusively for brood-rearing. The honey this apiarist markets is clover, thistle, and possibly boxthorn mixed. If allowed to granulate under natural conditions the honey has a rather sandy grain.

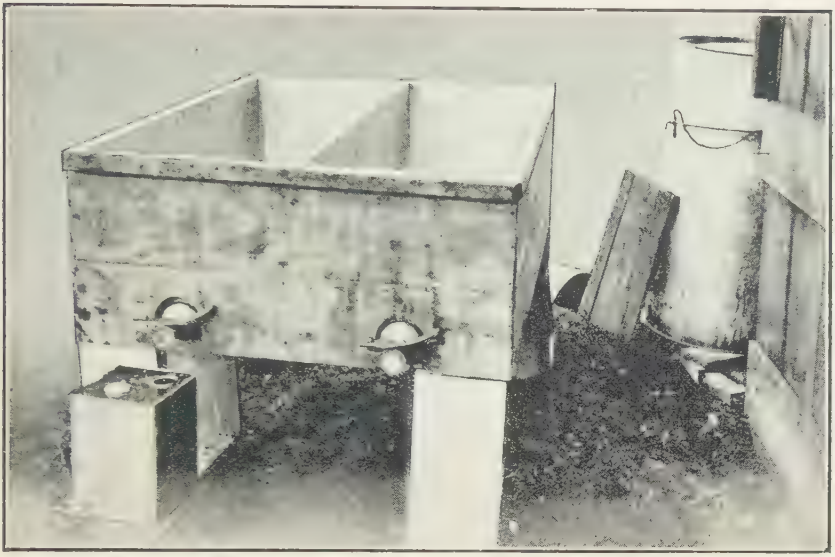
Equipment.

The plant necessary for the proper manipulation of honey is not expensive. As the illustrations indicate, it consists of a Severn capping-melter, as was shown at the recent conference; a small stove, over which this is placed; a trough 7 ft. or 8 ft. long, 1 ft. wide, and about 9 in. deep, with a honey-gate at one end; a tank to hold 3 or 4 tons of honey, which we call the settling-tank; and two granulating-tanks, each capable of holding half a ton. The dimensions of the latter are as follow: 5 ft. 6 in. long, 1 ft. 9 in. deep, by 1 ft. 9 in. wide. The settling-tank and the granulating-tanks should each have a honey-gate of 3 in. or 3½ in., the latter for preference.

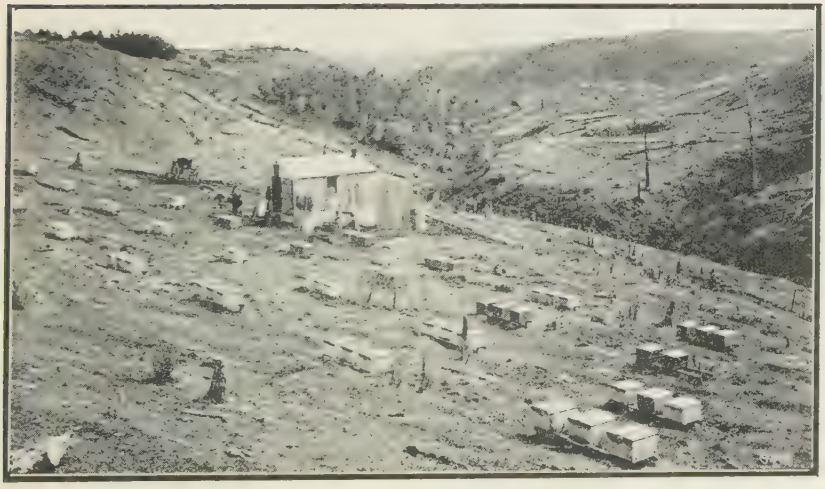
Manipulation.

Mr. Nicholas uncaps over the capping-melter at the rate of one hundred combs per hour. He uses a steam-heated uncapping-knife, and his extractor is driven by a 2½ horse-power benzene engine. The honey from the extractor runs directly through a strainer into the shallow mixing-tank, and also the honey from the capping-melter. The gate at the end of this tank is closed, and when it is nearly full the contents are stirred until the warm honey from the capping-melter has been well mixed with the cold from the extractor. The gate is now opened, and as the house is built on a hillside the honey gravitates into a cheesecloth strainer, which is tied under the above honey-gate and over the entire top of the 3-ton settling-tank. This cheesecloth strainer is tied very loosely, so much so that the centre portion will touch the bottom of the tank, which, when full, floats the strainer on the top of the honey. At times a large quantity of honey has been put through per hour, and it has never blocked up or given any trouble from first to last of a 5-ton crop. When the tank is full for the last time, take up as much slack of the strainer as possible; then, when the majority of the honey has strained through, dump the balance into the capping-melter. It is very important to keep the tank covered with sheeting or canvas.

The honey is run from the big tank into the half-ton granulating-tanks, and into each of these is mixed 10 lb. or more of granulated

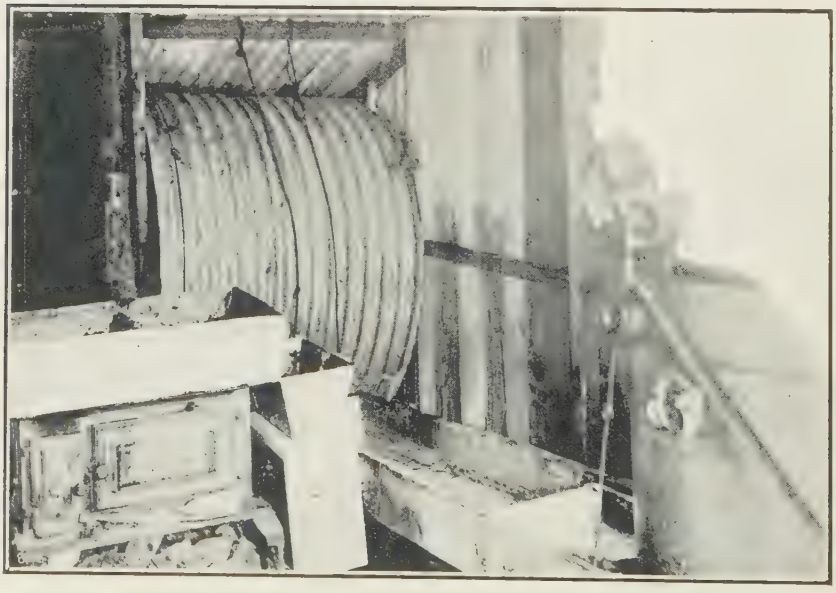


The Two ½-ton Granulating-tanks.



The Outyard, showing Extracting-house built on the Gravitation Principle.

Mr. J. Nicholas, with his Style of 12-frame Hive in Winter Quarters.



Interior of Extracting-house, with Stove, "Severn" Melter, and Mixing-tank connected with Extractor. Large Tank not in Position.

honey. The larger the quantity of the granulated honey used the quicker will be the granulation. This 10 lb. is called "starter." Probably the hardest work begins now, for it is no light duty to stir each of these tanks two half-hours a day. This, however, has to be done until the granulation is well forward and a fine grain assured. When in this condition it is so thick that it will just run through the gate, and when tinned off will granulate within a few days. It is advisable to have a large gate in each of these tanks. Keep them covered as much as possible. Tin off three quarters of each tank, and the next filling will be speeded up considerably.

Remarks.

It will be acknowledged that warming the honey to a thin consistency materially assists the strainers to properly perform their function in extracting from the honey particles of wax and other foreign bodies. Bubbles, froth, and scum are caught by the cheesecloth strainer and prevented from straining into the honey in the big tank. "With arrangements of this description," said Mr. Nicholas, "there is no necessity to skim any of the tanks. The heating and efficient straining eliminate the scum from the honey, and the stirring and starter gives a fine grain and quick granulation."

The Americans have for some time past advocated stirring the honey for a fine grain, and I have no doubt that our coarser-grained honeys could be improved to a wonderful extent by this simple method. When the grain is coarse there is a certain amount of levulose and water which adheres to the granules, and this condition usually imparts a "mushy" appearance.

Honey should not, however, be stirred to excess, otherwise a soapy, flaky article will be the result. When in this condition it will draw out and impart a shiny and satin appearance, but it will not granulate hard and firm. It is also likely to change to a dull colour. Some, however, prefer it this way, as it spreads more easily on the bread.

The Capping-melter.

A number of beekeepers have condemned capping-melters without giving them a fair trial, and to these I can recommend the Severn. Should their use not be considered advantageous, some other form of heating-apparatus must be employed. The small stirring-tank could be water-jacketed and connected with a boiler, or, failing this, lamps could be placed under the tank. The cost of the necessary tanks, &c., would probably not exceed £10 to £15.

THE GARDEN.

W. H. Taylor.

Onion-culture.

There are so many inquiries about onion-growing, and so many people have wrong ideas about it, that it seems worth while to give a *résumé* of it once more. Onions are grown for different purposes, and local conditions have also to be met. It may not be possible to furnish an exact guide for all. The personal equation must tell largely in the matter, for judgment must be used, backed by local knowledge and some acquaintance with the subject. I will try to indicate the method that should be followed. Some have a desire to meet the requirements of the early market. I am not sure that this is wise, as Australia can send them to us early. Probably very late onions are most profitable. But to have sound onions late they must not have been late in ripening, for late crops seldom ripen properly. The earliest crops of ripened onions are from autumn-sown seed. It is not safe to sow before the last days of March, or they will most likely bolt to seed. If kept later than the first week in April they will not make sufficient growth. It is as well to say here that there is always some danger of autumn-sown onions bolting, but usually, if the seed-head is broken out as soon as it is seen, it will not come away again. But this must not be taken to mean that this is always the case in any circumstance — it is not, for if sown too early they will throw up seed-heads again and again. The most effective method is to transplant in spring. This means a good deal of work; but in attempting to grow onions one must be prepared for this. It is easy to plan to grow several acres, but circumstances must be very favourable if this is to be successfully accomplished. It should be understood that if onions are sown in autumn in their permanent bed, in most cases there will be a lot of work in the way of cultivating, &c., to be done. In some places the nature of the ground will render this impossible. Any one wishing to obtain early ripened bulbs should remember that quite the earliest bulbs are to be obtained by sowing in autumn in the permanent bed, and he should find out if the condition of the soil is such as will allow this to be done. If the land lies wet, or is subject to much growth of weeds, this cannot be done, because it would be then impossible to keep the weeds down. Although there is more risk of bolting when not transplanted under suitable conditions, onions may be grown without transplanting. Though transplanting means work, yet a lot of winter

work is thereby spared, because for transplanting the seed is sown thickly, and consequently there is not much work in the winter with only the few rows that would be required. Transplanting is not a very serious undertaking for any one who is expert and nimble. Autumn-sown onions, however well ripened they may be, never keep as long as the same kind sown in spring and well ripened. For this reason market-growers who wish to supply the market as long as they can sow an area in autumn and a larger one in spring. Transplanting will in many places be done before this article is published; if not, it should be done as soon as it can be accomplished. The surface should be well prepared, all lumps being broken by rolling or by the drag. Wood-ashes and soot are both excellent fertilizers, wood-ashes being additionally valuable because it helps to keep the surface open, and soot because it keeps insects away. Give as much of the latter as you can, but do not put much of it close to young plants, or it will be likely to cause injury. I believe all important authorities agree in giving soot a premier place as an onion-fertilizer. Superphosphate and basic slag at the rate of about 3 cwt. per acre give good results. Transplanting should be done in drills, not by the dibbler. The drill should be made by some mechanical contrivance. A length of 3 by 2 timber, with teeth of sharpened battens set to make four drills 15 in. apart, is a good tool. The drills must be very shallow, for the roots of the sets must be barely covered both at transplanting and when the plant is upright. A quick way to plant is to lay the young plants on their sides with the roots in the drill. Then draw in sufficient soil to a little more than cover the roots. It does not matter about being too exact, for when the plant rights itself, as it will before long, it will then not be too deep in the ground. About 4 in. apart will give room for good-sized onions suitable for market purposes. Grown in this way the bulbs are likely to be more uniform in size than when not transplanted, because in the latter case the distance apart varies. Large onions are produced by sowing the giant kinds in autumn and transplanting in spring. The distance apart must be according to the size of onion desired, and may be up to 15 in. apart. 10 in. apart is a fair distance, and is about that which I have usually employed to produce 3 lb. bulbs. Spring sowing extends over the period embraced by July, August, and the first half of September, according to locality and condition of soil. The earlier in this period the seed can be got in the better it will be if—and this is important—continuous growth is assured. It is bad to sow if after the seed has germinated the young plants stand long without growth. The soil should be in good condition, and should be made

firm by rolling or other means before the drills are drawn. 3 lb. of seed will sow an acre or a little more with drills 15 in. apart. The distance mentioned is sufficient to allow of cultivation with a Planet Jr. implement. Cultivation should be frequent, a loose surface free from weeds being essential. Care should be taken to sow the seed thinly, so as to as far as possible avoid labour in thinning. Thinning should not be done too exactly. Use judgment as to what is necessary. In theory thinning is done to regular distances, but in actual practice very little is done at all, for it takes too much time, and a little extra manure to compensate for close cropping is cheaper than the labour required, but it does not result in bulbs of even size.

Vegetable-culture.

Peas may be sown twice during the month. The varieties usually grown remain in good bearing about two weeks. There are generally small quantities to be got for a further period, but the crop is practically over in two weeks. Very-tall-growing sorts last longer if supported by sticks, but these are not very generally grown in this country. Any one wishing to grow tall varieties should sow less seed than of medium-height sorts. Very tall sorts like Quite Content will cover the sticks if the plants are 6 in. apart, for they have a branching habit, and will give their best only when enabled to develop their natural habit, which they cannot do if crowded. Peas of even moderate height crop the better for being supported on sticks, and the pods are finer in appearance.

Turnips may now be sown in all places, danger of running to seed being now past. Turnips take about eight weeks from sowing the seed till the first are ready to pull, and the same period may be allowed for use from a bed. After that they get tough. It is therefore best to sow again when the first are taken from a bed. Sow little and often is the best policy. Turnip-seed should be sown thinly in very shallow drills. It is so easy to sow that it is possible to sow thinly enough as to obviate the necessity of thinning. The rows may with advantage be left in what might be considered a rather crowded state, and be thinned out as they are pulled for use. By this means an astonishing number can be got from a small patch. This is the market-gardener's way.

Jerusalem artichokes are one of the easiest of vegetables to cultivate and the most certain of good results, being troubled by no pests. The true use of the artichoke is as a winter vegetable. It may, however, be used long before that time if desired, as soon, in fact, as the tubers are large enough. The red-skinned variety is best. I have never yet seen good tubers of the white-skinned

variety. The soil should be deeply trenched and of a friable nature. Choose sets of quite medium size. Very small sets make weak stems, and strong stems must be present if a good crop of tubers is to be secured. Large sets throw up too many stems, resulting in a large number of small tubers. If a greater number of stems than three appear, it will be wise to break out those in excess of that number. When the stems are about 4 ft. in height cut off the tops. This will cause them to branch, and prevent flowering, which is exhaustive. The branching accelerates root-action and materially increases the size of the tubers. Plant about 4 in. below the surface in rows not less than 3 ft. apart, allowing more rather than less, and having a space of 15 in. from set to set.

Carrots.—Varieties of the short-horn type are best for early crops, because they are usable when quite small. Within a few days of leaving the seed-leaf stage they are palpably carrots, and in a very short time are fit for use. While half as large as one's little finger they are fit for use in soups, &c. This habit renders thinning almost unnecessary, or rather, I should say, there is no occasion to make a special operation of it, but make use of the thinnings, and do it as they are wanted. A comparatively small lot should be sown, only enough for the early summer months. After that the larger sort, put in as the main crop early in November, will come into use.

Parsnip seed may be sown if they are wanted early, but it is not good practice to sow a long time before it is necessary, as the ground could be used for something else. The beginning of November is in most parts early enough to enable them to fill their proper place as a winter vegetable, and it should be understood that when sown early they are likely to become overgrown and coarse by winter. It is, in fact, best to sow only a small lot early if they are wanted for early use or autumn shows, and the main crop at the time stated above.

Cauliflowers.—It is useful to sow cauliflower-seed early in September. Early London sown should then be in use by the end of January, and a giant kind, such as Metropole or Autumn Giant, by about Easter-time. The latter time is a most useful one for them to come in, as peas and French beans will then be finished.

Sow *lettuce* and plant out from earlier sowing.

Sow *radish* in small quantity every ten days.

If it is intended to raise *marrows, pumpkins, hardy cucumbers,* and *melons* in boxes, now is the time to put in the seed. The advisability of doing this is, however, questionable, for if the seed is put out in the open ground early in November they come into bearing about ten days later, and much labour is saved.

Tomatoes.—It is important that the plants be pricked off early, before they become drawn, for if they get in that state they droop, and unless bottom heat is available there will almost surely be many losses. Quite the best way to raise plants is on a mild hotbed. I do not, however, advise any one not practised in its use to raise the seed on a hotbed, for they run up with astonishing rapidity. After the young plants have been raised without heat the hotbed comes in very valuable. Prick off the plants as soon as they can be handled. Water them, and then put the boxes on the hotbed. Shade for a few days till the plants start growing, then give full exposure to light and air. The plants will grow very rapidly. As soon as they begin to run up, tilt the lights in such a way as to cause a current of air to pass right through the plants, and they soon obtain toughness and a very healthy appearance. The sides of the frame should not be high, for the plants must not be far from the glass. After a while the plants should reach the glass, and then the lights should be propped up to keep them clear. When the plants are sufficiently grown remove them to a cold frame to harden before standing them outside.

Celery.—Early-raised plants require to be pricked off while very small, for if they become drawn they are difficult to deal with. When the seedlings are large enough to handle place them out in the open, and they will not run up as fast as they would if in a frame, while they also get hardy and strong. About the middle of September seed may be sown in the open ground in rich, free soil. Plants from this sowing will supply the main crop.

Small Fruit.

Cape gooseberry plants may be put out as soon as danger from frost is past. The way of planting I prefer is the three-in-a-triangle method, having the plants 6 in. or 8 in. apart, and clumps 4 ft. to 5 ft. apart every way. Planted in this way the growths mingle, and the united strength prevents injury by wind. Last year's plants if only one year old will grow again this season. If subject to frost they will have been cut down, and will send up shoots from the bottom. Cut off the dead tops of these, and if any have not been cut down by frost cut them down to within a few inches of the ground.

Strawberry beds should be got in order. If weedy, clean them with as little disturbance of soil as possible. A litter of straw, &c., will help to keep the soil clean and open, and later will protect the fruit from the soil. It is still not too late to plant. The result will be in accordance with the quality of the plants. If these have been prepared as previously advised they should fruit well.

The Flower-garden.

It is now time to get everything in order ready for the coming season. The planting of everything of a permanent character should be completed as soon as possible. Of course, there are many conditions that rule the actual time at which it is best to do various things, and it is of no use trying to get ahead of these. Some districts are subject to heavy falls of rain in the spring, and when this condition is accompanied by poor drainage the soil gets full of water, and newly planted trees cannot root in it. Losses are certain to follow planting that takes place while this state of things exists. It is better to wait till the soil gets drier and warmer, even though that time may be rather late for many or most places. In the garden proper, however, such a condition should not exist, and planting should be done at the proper time. If water does hang about in the subsoil an effort should be made to get rid of it. Very many of the troubles of the gardener are caused by bad drainage, or sour soil caused in other ways. Soil may be made sour by using unsuitable manure. Fowl-manure applied in a wet state to heavy soil will quickly make it sour. The proper way to deal with it is to keep it dry in a covered place, and mix it with dry earth or wood-ashes. It then turns into a dry powder, and may be broadcasted on any soil without injury. Cow-manure also sours strong soil if used in anything like a fresh state. It likewise should be stacked till it is in a powdered state, although this may take two years. It is injurious to crops before it reaches this desired condition. Aphis on roses is usually caused by something improper, such as already indicated, or may be by sousing on a lot of strong liquid, sometimes from the washtubs. Where there is efficient drainage, and what may be termed clean cultivation, it is seldom troublesome. A good amateur carnation-grower said, in a paper he read about them, "Aphis is always troublesome." I deny that *in toto*. Aphis is only troublesome when the soil is made overrich in the way he advises. Good carnations may be grown, and are grown, without being attacked by aphis. Make the ground firm and work plenty of manure into the lower strata of soil. For the top spit give new soil from the top spit of an old pasture—soil that has plenty of the fibrous roots of grass in it, rather than a lot of manure of any sort. Give an occasional top-dressing of soot, and aphis will not be troublesome, unless you give a lot of liquid manure.

All half-hardy plant seeds should be sown at once if it is intended, as is necessary in most cases, to raise them under glass. In places where a warm summer is usually accompanied by a more than average rainfall they may be sown in the open. In these

places it will be best for those not in possession of good means for raising plants under glass to hold the seed and sow outside in the place where they are to flower. The early part of November is a suitable time. This refers to asters, zinnias, ten-week stocks, celosias, and suchlike, but not to salvia Bonfire. This latter requires a longer time to grow, and it is necessary to put out good plants, as they will be only a partial success.

Hardy flower-seeds of all kinds may now be sown in the open ground.

MARKET CONDITION OF LOCAL FRUIT AND VEGETABLES.

The Fruit Inspectors of the Orchards, Gardens, and Apiaries Division report as follows on the condition of locally grown fruit and vegetables in the shops and auction-rooms, and the market position of these for the month of July:—

Auckland.—During the earlier part of the month business in the fruit-markets was very fair. Late local fruit came forward in good quantities, and met a good demand where the quality was first class. In the latter portion of the month business was not so good, shipments falling off considerably. Prime dessert apples are selling well; cooking varieties are scarce, and inquired for; pears are very scarce, only small quantities being offered ex cool store. Poor-man oranges are coming forward in large quantities, and are selling well. Lemons are in rather short supply. Small fruits such as hothouse grapes, passions, and tree-tomatoes are very scarce. Fair average prices for the month are: Apples—dessert extra superior 9s., good 7s. 6d. to 8s. 6d., others 4s. to 6s.; cookers, best 7s. to 8s., good 6s. to 7s. Pears—dessert, best 11s. to 12s., good 8s. to 9s.; cooking, 6s. to 7s. Poor-man oranges, 5s. 6d. to 6s. 6d. Lemons—prime, 10s. to 12s.; good, 7s. to 8s.; rough and coarse, 4s. to 5s. Hothouse grapes, 2s. per lb. Tomatoes, 6d. to 7d. per lb.; tree-tomatoes, 4s. 6d. to 6s.—*C. Berridge.*

Wellington.—The market has been quiet during the month. Small consignments of apples are to hand, and prices are fair. The fruit is cleaner, and the grading has slightly improved. Pears from cool store are bringing very satisfactory prices. Very small lines of tomatoes are to hand at good prices. Potatoes are the same price as when last reported on; onions are lower. Vegetables are in brisk demand at good prices. Approximate values are: Apples—Sturmers, 6s. to 8s. 6d. per case; Jonathans, 6s. to 10s.; other desserts, 5s. to 8s.; cookers, 5s. to 8s. Pears (cool-stored)—Keiffer's Hybrid, 6s. to 7s. per case; Winter Nelis, 13s. to 14s.; Winter Cole, 13s.; Josephine, 12s. to 14s. Vegetables: Cabbages, choice 6s. to 9s. 6d. per sack, others 4s. to 5s.; cauliflowers, choice, 15s. to 19s. per sack; marrows and pumpkins, 4s. to 5s. 6d. per sack. All other vegetables are in good demand at satisfactory prices. Potatoes are £4 per ton, onions £5.—*T. C. Webb, jun.*

Christchurch.—Apples are now the mainstay of the markets and are very plentiful. Some very creditable well-coloured apples from local cool stores are on the markets and are realizing well. Pears are about finished. A few Poor-man oranges are to hand from Auckland. Average prices are: Apples—dessert 7s. 6d. to 8s. 6d., cool store 10s.; cookers 6s. to 7s. 6d., cool store 8s. Pears (scarce), 6s. to 10s. Tomatoes, 9d. per lb. Poor-man oranges, 10s. to 11s. Walnuts, 6d. to 8d. per lb.; chestnuts, 3d. per lb.; hazelnuts, 3d. per lb. Onions, £3 10s. per ton. Potatoes, £1 10s. to £2 10s. per ton. Cabbages and cauliflowers (in short supply), 4s. to 9s. per dozen. Other vegetables are in good supply and demand.—*G. Esam.*

Dunedin.—The past month on the wholesale fruit-markets has been rather a quiet one. In the earlier part of the month very fair prices were ruling for such consignments of local fruit as came to hand, and the demand was more or less in advance of the supply; but the reduction of duty on Tasmanian apples, and consequent heavy shipments, and the arrival almost simultaneously of two fairly large shipments of citrus fruits from the Cook Islands, has had the effect of practically glutting the local market with imported fruit. Prices consequently fell considerably towards the end of the month. Fair average prices for the month would be difficult to arrive at, but the following may be taken as approximate current values: Apples—cooking, first grade 2d. per lb., second grade 4s. 6d. to 5s. 6d. per case; dessert, choice varieties 7s. 6d. to 9s. per case, good varieties 6s. to 7s. 6d. per case, second grade 5s. to 6s. Choice varieties of pears well graded are fetching 3½d. to 4d. per lb., cooking varieties and second-grade pears from 2d. to 2½d. per lb. These are in short supply.—*C. Craigie.*

Invercargill.—Apples and pears are the only New-Zealand-grown fruits on this market at present. A strong feature is some very choice apples grown in the Teviot district of Central Otago. Canterbury growers are well represented here with both apples and pears. The majority are of good quality. Apples in particular appear in short supply, and very fair prices are maintained. Vegetables are of good quality and plentiful, as the past season has been favourable. Average prices were: Apples—dessert, 3d. to 3½d.; cooking, 2d. to 2½d.; pears—dessert, 3d. to 4d.; cooking, 2d. to 2½d.: all at per lb. Potatoes, prime, £4 to £4 10s. per ton; on trucks at railway-sidings, £2 15s. to £3. Onions, 7s. per bag, £6 per ton; cabbages, 3s. 6d. per sack; swedes, 1s. 9d. to 2s. per sack; carrots, 2s. per bag; parsnips, 2s. 6d. per bag.—*R. Hutton.*

TREE-LUCERNE.

The tagasaste (*Cytisus proliferus*), which is popular in this country as a rapidly developing plant for shelter purposes, is generally (but wrongfully) known as "tree-lucerne." Tagasaste bears an abundance of white blooms during winter and early spring months. The true tree-lucerne (*Medicago arborea*), though a member of the same family, is distinctive in having yellow flowers, is not as robust a grower as tagasaste at Moumahaki Experimental Farm, and is therefore not so valuable in this district for the purpose for which tagasaste is commonly employed. —*W. S. Hill, B.Agric.*

AMERICAN BEEF-MARKET.

There is every indication that the price united growers will obtain for fat cattle will advance to 8d. per pound. The shortage of cattle, the increasing demand, and the fact that the maize (corn) crop is seriously short are the determining factors. Maize is the great cattle-feeding ration, hence the effect of the shortage of the crop on the price of beef.—*E. Clifton.*

The Ruakura Farm of Instruction has disposed of its six remaining Jersey bull calves at an average of £39 1s. 8d.

During the financial year ended 31st March the fruit imported into the Dominion was valued at £311,610, against £426,840, the value of the fruit imported during the previous corresponding period.

ANSWERS TO CORRESPONDENTS.

CORRESPONDENTS are requested, when desiring information through the Journal in regard to disease in animals and plants, to forward, where possible, affected specimens, in order to facilitate a correct diagnosis of the trouble and to ensure the best advice. In stating a question the most complete descriptive details should be furnished.

Correspondents desiring information in regard to manurial treatment of soil are requested to fill in and forward the prescribed form -"Application for Advice as to Manurial Treatment of Soil"—obtainable from any office of the Department in the Dominion.

In every instance a question to which an answer is desired in these columns must be accompanied by the full name of the inquirer, not necessarily for publication, but as a guarantee of good faith.

Mortality among Cattle.

J. W., Clarkville :—

1. A heifer calf, born 12th December last, was well reared, and turned out in excellent condition at age of four months and a half with a number of other calves. Paddock was swampy with good camping-places. About three weeks ago it was noticed to be getting very poor and dull-looking ; also had become infested with lice, and was scouring somewhat. On the 6th July was scouring badly ; was shifted on to fresh, drier ground and comfortably bedded at night in loose-box ; and was fed with new milk boiled and an egg night and morning, also allowed access to hay (it had had hay from the 1st May). On the 8th stopped cudding ; was then given tincture of opium and two drops carbolic acid in the milk ; was now showing symptoms of intense pain. On the 11th was given one teaspoonful of lysol in milk, but died that evening, and was scouring worse and worse up to death. Examination of stomachs after death showed the rough interior lining of the paunch (papillæ, &c.) to have disappeared in large patches, leaving a white smooth surface—in fact, you could almost see through it in places ; contained a good deal of hay and grass, although none taken for several days. Third stomach was full and felt fairly hard from the outside ; contents (hay, &c.) were dry and rather hard in the centre of stomach. Fourth stomach contained the milk given a little before death, undigested, but did not appear to have anything wrong with it. What was wrong with the calf, and how should it have been treated ?

2. A neighbour's cow got at a bag of wheat and ate about a bushel. Shortly after she ceased cudding ; bowels failed to act, was in evident pain, and died about the fourth day. Opened after death, rumen was very full of hay and a little wheat. Third stomach badly impacted—hay in hard dry layers which would require a knife to shift them ; a little wheat present ; leaves of stomach in places suffused with blood. Fourth stomach full of unchewed wheat, which apparently had not been through the other stomachs ; bowels contained a little wheat and fluid. What was the immediate cause of death in this cow, and could she have been saved ?

3. Another neighbour's cow, recently bought, went down about a fortnight after calving and died in a couple of days. On being opened she showed the third stomach very badly impacted, although the folds were not blood-stained. She was fed on mangels, carrots, and hay : why, then,

should she be impacted? I myself also had a cow die of impaction of the omasum about a fortnight after calving, although she was fed on the best of hay and good mangels. How are such cases to be explained and the losses to be avoided?

The Live-stock and Meat Division:—

1. Although you do not mention finding parasites in the fourth stomach it would appear that their presence was the real cause of the trouble. There are usually two of them, the *Strongylus contortus* and the *Strongylus ostertagi* or *cervicornis*, and on account of their small size may easily be overlooked without they are specially sought for. The *Strongylus ostertagi* is probably the worse of the two and the more difficult to get rid of, as it encysts itself in the mucous membranes of the stomach where medicines cannot reach it. It is very small, pale-coloured, and hairlike. The males are only about $\frac{1}{10}$in. in length, the females being about $\frac{3}{5}$ in. The *Strongylus contortus* is thicker and longer, being about 1 in., and often reddish in colour. They can usually be distinguished soon after death by placing some of the stomach-contents in a thin glass dish placed over a black substance. Treatment is not very satisfactory; more can be done by good feeding, rearing on fresh, dry ground, and seeing that the water-supply is pure. The calves get the trouble by picking up the eggs or the young parasite, and these may live on damp ground for some time. It is a general practice to rear calves year after year on the same ground, consequently it gets contaminated. Whenever the trouble is found the next season's calves should be reared elsewhere, and the old paddock limed and ploughed up. With regard to medicine, probably lysol is the best to give. A teaspoonful should be given every morning in a pint of milk or thin oatmeal gruel for days running, then miss a week and give another course.

2. The cow evidently died of acute indigestion. It is doubtful whether she would have recovered even if treatment had been attempted. Oleaginous purgatives and stomach stimulants might have done some good.

3. We do not think either of the cows died from dietetic trouble. Septic metritis, or inflammation of the womb, was the more likely cause.

Mating Young Heifer.

"Rawiti," Auckland:—

I have a heifer calf nine months old sired by a purebred Jersey out of a three-quarter-bred Jersey: how old should she be when put into calf to obtain the best results?

The Live-stock and Meat Division:—

In the Channel Islands the usual practice is to get the heifers to calve at two years off. We should not therefore advise you to mate the heifer until November twelve months.

Strangles.

Mr. W. Smellie, Green Island:—

Please inform me whether strangles affects the legs of a horse.

The Live-stock and Meat Division:—

Your question is not quite clear. Strangles, if it runs its usual benign course, does not affect the legs any more than is usual in any other fever. Owing to constitutional disturbance with the circulatory and lymphatic systems the legs are apt to "fill" in these cases, owing to the serum, or watery part of the blood, exuding into the cellular tissue under the skin.

It sometimes happens, however, owing principally to bad hygienic conditions and treatment, the disease takes on an irregular course, the abscesses (which usually form in the space between the lower jaws) maturing in the internal organs and the different lymphatic glands. This is commonly termed "bastard strangles," and the condition is serious. Even in these cases, however, it is rare than an abscess forms lower than the loose tissue under the forearm or inside the thighs. In stallions the testicles are often affected.

Grass-grub.

"Amateur," Golden Bay :—

Would the introduction of moles into land that is affected with grass-grub be of any benefit in coping with the pest ? If so, would there be any objection to their introduction into this country ? From the little I have read of them I understand they burrow just under the surface of the ground and live on worms, wireworms, grubs, &c.

The Biologist :—

I do not think moles would be of any value for the control of grass-grub, and if they become sufficiently numerous to prove effective in this respect they would certainly prove a nuisance in other ways.

Eradicating Docks.

A. F. M., Upper Riccarton :—

Having just taken over a small block of 10 acres here which is very badly infested with docks, I should be glad if you could advise me the best and quickest way of eradicating them. The pastures were laid down, I understand, about twelve months ago, and last year the docks were neglected and let go to seed. The land is heavy and rich.

The Fields and Experimental Farms Division :—

Without breaking up the pasture your best treatment is to drain as thoroughly as possible, and if the docks are not too numerous cut them with a sharp spade an inch or two below the surface without disturbing the surface of the ground to any extent. If this is too great a task, drain well, mow the docks, and at the same time top-dress with about 3 cwt. of basic slag. The abundant growth of clovers and grass encouraged by the slag will tend to choke out the docks. Should this not prove effective the only way to get rid of the docks is to skim-plough and let lie for a time, then cultivate with a broad-shared cultivator at intervals during the summer, and follow by a smother crop of rape or mustard, heavily seeded, in the autumn. A crop of potatoes or a drilled crop of turnips or mangels well cultivated should also be suitable as cleaning-crops.

Oats.

S. P. J., Methven :—

Could you tell me what kind of oats to sow to get the best yield, to stand the wind, and to get a good sample ? How much would you sow in medium land to the acre for the coming season—the oats to be threshed ?

The Fields and Experimental Farms Division :—

For the conditions described Waverley (Gartons) should give satisfaction. Sow about 2 bushels per acre.

Spineless Cactus.—Pasture.

"Inquirer," Sherwood Downs :—

Could you give me some information concerning the spineless cactus? Could it be grown as a vegetable or for stock in this district (Fairlie, South Canterbury), and where could the seed be obtained? Would it have to be protected from stock while young, and, if not, would it succeed on tussock country?

I would also be glad to learn if the grass (native) which covers some of the hills round about Wellington has ever been tested in this part of the country for regrassing run-out tussock land. On my brother-in-law's place at Ohariu two big sheep are carried to the acre on it, on land which seemed to me to be in no way superior to a lot of my own country on which I can only carry one sheep to 2 acres. If the grass has never been tried in these parts I would be glad if I could be supplied with a few pounds of the seed before the spring in order to test it myself.

The Fields and Experimental Farms Division :—

As far as is known, spineless cactus has not been grown in New Zealand, and we have therefore no practical knowledge of it. As it is a "made" plant, great care should be taken in sowing or introducing it, as there is the danger that it may revert to some objectionable type and become a pest. Mr. B. Harrison, F.L.S., Burringbar Post-office, New South Wales, Australia, has published an article on it. If communicated with, he might give you definite information regarding it. It is observed that in some of the States in Australia legislation is being advised to prohibit the introduction of this plant, for the reason that it may revert to some objectionable form.

The common native grass of Wellington hills is *Danthonia pilosa*. To my knowledge there is very little of this grass growing in your district. It was tried in the revegetating plots in the Mackenzie country, but with very little success. I do not think the grass is suitable for high altitudes. 4 lb. of this was posted you from Christchurch on the 27th ultimo.

Autumn Feed.

Mr. G. Howard, South Norsewood :—

I am sowing a few acres down in oats. Could you kindly tell me of anything I could sow with them that would come away when I cut the oats, thus providing plenty of autumn feed?

The Director of the Fields and Experimental Farms Division :—

Cape barley could be grown with the oats for purpose of providing autumn feed. A little red clover might be grown in the mixture, and when cutting the oats a reasonably long stubble could be left.

Lucerne-culture.

"Inquirer," Darfield :—

I have an acre of land on which I would like to try lucerne this year. Please inform me as to its suitability. The last two seasons' crops have been potatoes and oats, the oats being fed off by cows. The soil is good and light, but is rather shingly. Should you consider the land unsuitable for lucerne, what can I grow so as to produce green feed in the dry summer months?

I should also like to know if the Department is offering seed, lime, and soil this year?

The Fields and Experimental Farms Division :—

Your land would appear to be suitable for lucerne provided it is clean, well drained (water-table being at least 5 ft. below the surface of the ground), and possesses a fairly open subsoil. Should you not grow lucerne, peas and oats, Western Wolths, Cape barley, Italian rye and vetches, or Emerald rye should produce good green feed for summer and autumn. It has not yet been decided whether the Department will renew the offer to supply seed, lime, and inoculated soil. If renewed, due notice will be given in the Department's *Journal*.

Green Feed for Cows.

"Acorn," Noah's Ark Farm, Hakaru :—

What are the best crops to sow for green feed for cows, and when should they be sown? I should like to begin to feed off at the end of December.

What are the best manures for these crops? The soil of my land is a poor clay (gum land).

The Fields and Experimental Farms Division :—

The following crops should give you the best results as green feed for cows: Russian blue peas and Algerian oats, 1½ bushel per acre of peas, 1 bushel oats; Western Wolths, 20 lb. to 25 lb. per acre; Italian rye and common spring vetch, 20 lb. to 25 lb. of each per acre; Emerald rye 84 lb. and common vetch 20 lb. to 25 lb. per acre; Cape barley, 72 lb. Having first worked the land well, use right away, if possible, 1 ton per acre of finely ground limestone. Where basic slag is used work in, if possible, some little time before sowing the seed. For the peas and oats 3 cwt. basic slag and 2 cwt. blood-and-bone manure could be used, and for the Western Wolths 3 cwt. of slag and 3 cwt. blood and bone. If backward, top-dress the latter with 1 cwt. of nitrate of soda. For the Italian rye and vetches 3 cwt. of slag and 2 cwt. blood and bone would be suitable. If backward, top-dress with 1 cwt. of nitrate of soda. For the Emerald rye and vetches use 3 cwt. slag and 2 cwt. blood and bone, or 1 cwt. blood and bone and 1 cwt. nitrate of soda, as a top-dressing. For the Cape barley, 3 cwt. of slag and 2 cwt. blood and bone.

For feeding off at end of December sow the oats and peas at the end of September or early in October. The Italian rye and vetches could be sown middle of October, while the Emerald rye and vetches, also Cape barley, could be sown a little later. This should provide a continuous supply of green feed from end of December on, the rye and Cape barley providing feed right into the winter. The Western Wolths could be sown about the time of sowing the Emerald rye and vetches.

Coprosma Baueriana.

"Sandy Loam," Manawatu :—

Will you inform me if *Coprosma Baueriana* will withstand the frost, as I intend planting a hedge of it from seed? If it does not, would you name a suitable shrub for a hedge in front of a house?

The Biologist :—

Coprosma Baueri will withstand a moderate amount of frost such as is normally experienced in Wellington. It is not, however, hardy in such localities as Christchurch, except where specially sheltered. Amongst

exotics trivet, eleagnus, and the various species of escallonia form excellent hedges, while amongst natives *Pittosporum tenuifolium*, broad-leaf, and *Olearia Forsteri* are amongst those most favoured for comparatively low hedges.

Fruit-tree Borer.

"Orchard Inquirer," Taumarunui :—

Under separate cover I am sending specimen of a grub that is boring into my fruit-trees—viz., apple, plum, pear, peach, and some small gum-trees. The eggs of the grub are now being deposited where the bark has cracked open. Could you inform me how to treat the trees, as most of the young ones are affected, and the young growth keeps breaking off at the point where the grub has attacked it? The soil here is a light loam, but there is no pumice.

The Orchards, Gardens, and Apiaries Division :—

The fruit-tree specimens have been attacked by cicada, commonly known as locusts. This pest is specially troublesome in new country, and, unfortunately, no means have been discovered for the prevention of injury to fruit and other trees. As the country becomes cleared, however, of bush and shrub the cicada almost entirely disappears. I would advise pruning the trees below the parts affected. Spraying with arsenate of lead when the insects are first noticed may check them.

Shelter-tree Planting.

Mr. A. H. Moore, Opunake :—

I shall be glad to know if *Prunus myrobalana*, common birch, flowering-cypress (*Tamarix gallica*), sallow or plain willow (*Salix caprea*), and *Hoheria populnea*, beech, and hornbeam will withstand the salt-laden gales to which my land is much exposed, being only a few chains from the coast.

Mr. W. H. Taylor :—

Tamarix gallica is naturally a littoral plant, and flourishes on the sea-coast. The sallow or palm willow and *Hoheria populnea* do well not far from the sea. *Prunus myrobalana* is not injured by a moderate exposure to sea-winds. With regard to the other trees mentioned, the chief danger would be salt-laden wind at the time of the bursting into leaf. Without actual knowledge I should say that if strong winds prevail at that time the trees would not succeed. You should plant freely of the Auckland rata—pohutukawa (*Metrosideros tomentosa*); it will flourish close to the sea.

Broom.

"Broom," Sherwood Downs :—

Is ordinary yellow broom of any feeding-value, and would it under any circumstances be justifiable to sow it for stock, as gorse is sometimes sown?

The Fields and Experimental Farms Division :—

Owing to the pungent taste of yellow broom it is not too palatable for stock, but under extreme conditions they might possibly eat it. Where grass is scarce, as, for instance, on poor land during a dry period or in winter, yellow broom may possibly afford feed for stock, cattle especially. As an improver of poor land it is sometimes grown, and for this reason alone on such land the sowing of it is justifiable.

Mustard for Green-manuring.—Potato Varieties.

Mr. E. C. White, Linton :—

Will mustard for green manure grow through the winter? Say one harvests oats off the land and sows mustard to plough in next spring.

I would like to know the potato best suited for my soil. The land has a heavy soil, about 6 in., and the subsoil is clay.

The Fields and Experimental Farms Division :—

Mustard will not grow through the winter, as it is frost-tender, but in autumn will grow well. The white mustard will, on stubble, provide in from six to eight weeks satisfactory growth to turn under as green manure. Sow broadcast on stubble land that has been prepared simply by discing and harrowing, as soon as the crop is off the ground. Emerald rye grows in winter. It could be fed off early, and provide subsequent growth for turning under in spring.

Either Up-to-Date or Gamekeeper should give you the best results. The soil should, of course, be well drained.

Fodder Crops.

"Omega," Tatua, Waitoa :—

I want to have some good succulent feed for my cows about February. Would it do to sow Cape barley with grass-seed—Italian rye, &c.—about October on turnip land?

The Fields and Experimental Farms Division :—

Cape barley and Italian rye-grass and other grasses could be grown together, though it would be better to sow the former two separately or with common spring vetch. For winter feed Cape barley and the black Scotch vetch or the winter or hairy vetch makes a good seeding. Sown at the end of October there should be a plenteous growth in February, provided the rainfall is not lacking. Later seeding of Cape barley and vetches would provide a continuous supply of green feed, even into the winter

Drill for Lucerne, etc.

Mr. Eric H. Alley, Llanmaes, Bridgeworth, Tasmania :—

What type of drill is used for sowing lucerne, also turnips, mangels, &c.? What is the approximate cost, and where is the implement obtainable?

The Fields and Experimental Farms Division :—

As far as we are aware no special drill is used for sowing lucerne. The system in vogue at this Department's Ruakura Farm of Instruction is to mix the seed with a portion of the fertilizers and sow through the manure-box of the ordinary corn-drill, having the coulters either removed or fastened up, the land having been previously rolled with a Cambridge roller, the rings of which make a good bed for the seed. The Ideal manure-distributor, price about £21, and procurable from Mr. Knight, of Albany, would make an excellent machine for this purpose, if the manure and seed were mixed in the manner described above. The same machine makes excellent work in sowing mixed grasses and clovers without mixing with the manure. It will also sow all kinds of fertilizers and lime—in fact, it is

an implement which may be recommended with every confidence. The best machine on the market for sowing turnips, mangels, &c., is the Storrie ridger, made in Invercargill, price £28 10s., and is now being fitted with a movable hopper to sow maize. This implement makes two rows and sows seeds and manures in one operation.

Ragwort.—Lucerne and Silver-beet Seed.

Mr. Lewis Eyre, Te Kawa :—

1. Is ragwort to be feared on ploughable land? Could you advise me how to treat it to keep it from spreading, or to get rid of it?

2. Can lucerne and silver-beet seed be obtained from the experimental farms? I was unable to get it from the seedsmen last year.

The Fields and Experimental Farms Division :—

1. Ragwort need not be feared on ploughable land, as cultivation will keep it under. It should be cut or pulled before flowering, to prevent spreading. Later on in the season it will often again come to flower, and should again be pulled or cut. Sheep eat it readily, and are a good means of keeping it under.

2. Lucerne and silver-beet seed cannot be obtained from the experimental farms. No difficulty has been experienced by the Department in procuring lucerne-seed from seed-merchants. Colonial- or Marlborough-grown seed would be found the best. Plain dark-green silver-beet is the approved variety, but we doubt if this can be obtained.

Shelter-tree Planting.

Mr. J. M. Wech, Warkworth :—

1. What would be the best hedge to grow for shelter in a windy situation and for enclosing one-fifth of an acre around the house? I noticed in the June *Journal* some facts about yew and box.

2. Would the cherry-plum (*Prunus myrobalana*) do well here for the paddocks both for shelter and for a cattle-hedge?

3. What is *Berberis vulgaris?*

4. Could you explain something about *Hoheria populnea?*

5. Where could the seed for these be obtained, and when should it be sown?

Mr. W. H. Taylor :—

1. With such meagre particulars it is not easy to advise. The position of buildings should be known, and the kind of soil. *Cupressus Lawsoniana* is one of the best plants. It is immune from injury by the fiercest winds; does well in most soils; can be kept as narrow as desired; is soft to the touch; pleasant to brush against; makes a screen so perfect as to exclude all wind; is not very hard on the surrounding soil. Pruning should be done instead of shearing—that is to say, use seccateurs, and prune so as to leave drooping sprays. Yew and box were mentioned only as illustrations. Yew hedges are the best of all—nothing else can compare with yew—but it is at first very slow, and does best in a comparatively cold climate.

2. It is probable that anxiety to get shelter would cause the hedge to be spoiled by hurrying it up. In any case, one would be inclined to think some other provision for shelter should be made—say, black-wattle or *Pinus muricata*, or both of these.

3. *Berberis vulgaris* is the common barbary, frequently planted for hedges.

4. *Hoheria populnea* is one of the native trees known as "lacebark" or "ribbon-wood." I cannot add to the information given in the June number of the *Journal*, and am unable to advise where seed may be obtained.

Top-dressing Grass Land.

"Rawiti," Auckland :—

Can grass land be top-dressed with pure fowl-manure? If so, in what manner and at what time to obtain the best results?

The Fields and Experimental Farms Division :—

As poultry-manure is the richest of all farmyard manures, it should be very suitable for top-dressing grass land. Being strong and quick-acting, heavy dressings should not be applied. Being richest in nitrogen, it would tend to encourage the coarser vegetation to the detriment of the clovers, but used with superphosphate it would prove a more balanced fertilizer, and the phosphate would tend to preserve a good deal of the ammonia, which otherwise would be given off into the air upon fermentation taking place in the soil. The manure should be thoroughly dried. The best method of distributing it is by use of an American farmyard-manure distributor. If such is obtainable the manure could be placed in small heaps over the area and scattered with a shovel as lime sometimes is. With an ordinary broadcast distributor the difficulty would be to get fowl-manure to run through it. Should superphosphate (at rate of, say, 1 cwt. per acre) be subsequently applied, the broadcaster could be employed.

Glass for Glasshouses or Glass-frames.

G. H. P., Geraldine, South Canterbury :—

Could you inform me whether glass ¼ in. thick would do for glass houses or frames for growing plants in? I have a lot of the glass on hand, but am not sure if it would do. It is glass that was in the roof of the Exhibition building at Christchurch.

The Orchards, Gardens, and Apiaries Division :—

The glass that you refer to should prove quite suitable for the roof of a glass house or for frames for raising plants.

Melons.

Mr. E. T. Sandford, Havelock North, H.B. :—

Which water-melons are the best to plant early on a manure heap?

The Orchards, Gardens, and Apiaries Division :—

Cole's Early may be recommended.

CALIFORNIAN BUTTER-MARKET.

It is stated that there are 2,500,000 lb. of local butter in store in San Francisco, the effect of a particularly good season in California. This should not exercise any effect on the importation of foreign butter. The price of butter has lately advanced, the best butters in the higher-class stores realizing up to 1s. 5½d. a pound. Prices are naturally high at this season of the year.—*E. Clifton.*

HEMP AND TOW GRADING RETURNS.

JULY.

Hemp.—The total number of bales graded was 4,080, as compared with 9,487 for the corresponding month of last year, a decrease of 5,407 bales. For the twelve months ending 31st July, 1914, the number of bales graded was 129,469 as compared with 150,527 for the previous twelve months, the decrease being 21,058 bales.

Tow.—During the month 1,482 bales were dealt with, as compared with 3,261 for the corresponding month of last year, a decrease of 1,779 bales. For the twelve months ending 31st July, 1914, the number of bales graded was 41,940, as compared with 52,265 for the previous twelve months, a decrease of 10,325 bales.

Stripper-slips.—During the month the number of bales graded was 35, as compared with 89 for the corresponding month of last year, a decrease of 54 bales. For the twelve months ending 31st July, 1914, the number of bales dealt with was 3,560.

HEMP, TOW, AND STRIPPER-SLIPS GRADED THROUGHOUT THE DOMINION DURING THE MONTH OF JULY, 1914.

Hemp.

Port.	Superior.	Fine.	Good-fair.	Fair.		Common.	Rejected.	Condemned.	Total.
				High Point.	Low Point.				
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	..	129	471	326	5	..	..	931
Napier	..	..	..	..	..	..	..	..	..
Foxton ..	..	..	138	725	255	31	6	..	1,155
Wellington ..	..	..	269	519	593	14	4	..	1,399
Blenheim ..	..	..	32	..	..	..	..	..	32
Picton ..	..	42	60	..	..	..	..	..	102
Lyttelton ..	..	..	33	..	..	..	..	..	33
Dunedin ..	..	..	66	64	24	21	..	..	175
Bluff	..	..	67	164	15	7	..	..	253
Totals ..	..	42	794	1,943	1,213	78	10	..	4,080
Percentages of totals	..	1·03	19·46	47·62	29·73	1·91	0·25	..	..

Tow.

Port.	First Grade.	Second Grade.	Third Grade.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	166	166	20	352
Napier	..	..	..	..	..
Foxton ..	49	200	10	..	259
Wellington ..	..	239	81	11	331
Blenheim ..	23	4	..	..	27
Picton	..	64	..	..	64
Lyttelton ..	..	183	..	..	183
Dunedin ..	..	36	..	7	43
Bluff	..	18	177	28	223
Totals ..	72	910	434	66	1,482

Stripper-slips.—Passed for export: Foxton—First grade, 20; second grade, 11; —total, 31. Wellington—Second grade, 4.

STOCK EXPORTED.

THE following table shows the numbers and descriptions of stock exported from the Dominion during the month of July:—

Port of Shipment.	Horses.			Sheep.			Cattle.			Pigs.		Dogs.		
	To Australia.	To Pacific Islands.	To London.	To Australia.	To Pacific Islands.	To South America.	To Australia.	To Pacific Islands.	To Montevideo.	To Australia.	To Pacific Islands.	To Australia.	To Pacific Islands.	To London.
Auckland ..	2	43	..	..	275	..	..	41	..	..	49	5	6	..
Gisborne ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Napier ..	..	..	..	50	..	..	..	..	..	..	..	..	..	..
Wellington	12	..	..	100	..	..	..	..	..	..	..	2	..	..
Lyttelton ..	21	..	..	122	..	..	..	..	..	..	..	1	..	..
Dunedin ..	1	..	..	..	..	..	..	..	..	..	..	5	..	..
Bluff ..	1	..	..	81	..	..	..	..	..	..	..	4	..	..
Totals ..	37	43	..	353	275	..	..	41	..	..	49	17	6	..

Auckland also exported 32 crates poultry to Pacific islands and 1 crate to Vancouver.

Following are the particulars of horses exported: Thoroughbreds—7 geldings, 1 mare, 1 filly; draughts—4 stallions, 3 geldings, 9 mares; ponies—1 stallion, 8 mares; 7 Clydesdale stallions, 1 cob stallion, 13 hack geldings, 24 light mares, 1 filly.

STOCK IN QUARANTINE.

THE following stock were received into quarantine during the month of July:—

No.	Description.	Sex.	Port of Origin.	Owner or Agent.	Address.
			MOTUIHI ISLAND (AUCKLAND).		
1	Toy terrier ..	Female	London ..	A. M. Wrightson..	Puketutu.
1	Half-bred collie	Male ..	Sydney ..	Mrs. Dampier Crosseley	Fendalton, Christchurch.
			QUAIL ISLAND (LYTTELTON).		
1	Cocker spaniel ..	Female	London ..	T. W. Richmond..	Addington, Christchurch.